

EMERGENCY AIRWORTHINESS DIRECTIVE



Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
**Federal Aviation
Administration**

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DATE: October 23, 2002

AD #: 2002-22-51

Send to all U.S. owners and operators of MD Helicopters, Inc. Model MD900 helicopters.

This Emergency Airworthiness Directive (AD) is prompted by four reports of cracks in the threaded area of the main rotor support static mast (mast). The cause of the cracking is under investigation, but preliminary analysis shows that lack of torque in the 12 bolts on the main rotor hub retention nut (nut) results in loss of preload in the mast. Without preload, the mast will incur alternating stresses that can lead to crack initiation. In the four reported cases, cracks were found in the mast less than 1 inch from the top. In at least one case, pitting was also found in this area. All of these cracks penetrated through the wall thickness. Cracks and pitting in the mast, if not detected, could result in failure of the mast, separation of the main rotor, and subsequent loss of control of the helicopter.

The FAA has reviewed MD Helicopters, Inc.(MDHI) Service Bulletin No. SB900-089R1, dated October 22, 2002, which describes procedures for checking the torque in the 12 bolts of the nut, inspecting the mast for a crack, and removing the mast from service if necessary.

This unsafe condition is likely to exist or develop on other helicopters of the same type design. Therefore, this AD requires, before further flight, for MDHI Model MD900 helicopters, serial numbers 900-00008 through 900-00110, with mast, part number 900F2401021-101, removing the main rotor drive shaft and inspecting the mast for any crack or pitting. This AD also requires removing the main rotor hub assembly and inspecting the mast threads for a crack. If a flaw is found in the thread root area and you cannot determine if it is a crack, this AD also requires a magnetic particle inspection (wet fluorescent) for a crack. If any crack or pitting is found, this AD requires removing the mast from service.

This rule is issued under 49 U.S.C. Section 44701 pursuant to the authority delegated to me by the Administrator, and is effective immediately upon receipt of this emergency AD.

2002-22-51 MD HELICOPTERS, INC. Docket No. 2002-SW-50-AD.

Applicability: Model MD900 helicopters, serial numbers 900-00008 through 900-00110, with a main rotor support static mast (mast), part number 900F2401021-101, installed, certificated in any category.

Note 1: This AD applies to each helicopter identified in the preceding applicability provision, regardless of whether it has been otherwise modified, altered, or repaired in the area subject to the requirements of this AD. For helicopters that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (d) of this AD. The request

should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required before further flight, unless accomplished previously.

To detect cracks and pitting in the mast resulting in failure of the mast, separation of the main rotor, and subsequent loss of control of the helicopter, accomplish the following:

- (a) Remove the main rotor drive shaft.

Note 2: MD Helicopters, Inc. Service Bulletin No. SB900-089R1, dated October 22, 2002, pertains to the subject of this AD and has a Figure 1 depicting the inspection areas of the mast.

- (b) Remove 1 inch of primer from the top inside diameter of the mast. During paint removal, wipe the area clean. Do not scrub or flush the area. Do not allow paint stripper to run down the inside or outside surfaces of the mast below the work area or enter into the transmission. Inspect the top 1 inch of the inside diameter of the mast for a crack or pitting using a bright light and a 10x or higher magnifying glass. If you find any crack or pitting, remove the mast from service.

- (c) Remove the main rotor hub assembly. Clean the threads of the mast thoroughly with solvent. Inspect the mast threads for a crack using a bright light and a 20x or higher magnifying glass. Pay particular attention to the thread root area. If you see a flaw in the thread area and cannot determine if it is a crack, perform a magnetic particle inspection (wet fluorescent) per ASTM E 1444-01 using an electromagnetic yoke or coil. If you find any crack or pitting, remove the mast from service.

- (d) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Los Angeles Aircraft Certification Office, FAA. Operators shall submit their requests through an FAA Principal Maintenance Inspector, who may concur or comment and then send it to the Manager, Los Angeles Aircraft Certification Office.

Note 3: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Los Angeles Aircraft Certification Office.

- (e) Special flight permits will not be issued.

- (f) **Emergency AD 2002-22-51, issued October 23, 2002, becomes effective upon receipt.**

FOR FURTHER INFORMATION CONTACT: Jon Mowery, Aviation Safety Engineer, FAA, Los Angeles Aircraft Certification Office, Airframe Branch, 3960 Paramount Blvd., Lakewood, California 90712, telephone (562) 627-5322, fax (562) 627-5210.

Issued in Fort Worth, Texas, on October 23, 2002.

David A. Downey,
Manager, Rotorcraft Directorate,
Aircraft Certification Service.